

C2 14. (Amended) A multi-piece golf ball comprising a core and a cover formed from a reaction injection molded material comprising polyurethane/polyurea.

REMARKS

In the Office Action of June 3, 2002, the Examiner reopened prosecution of this application in view of the decision by the Board of Patent Appeals of April 24, 2002. In that decision, the Board reversed the Examiner's previous rejection of claims 1-44 under 35 U.S.C. § 103.

Additionally, the Board remanded this application to the Examiner for further consideration of the patentability of the pending claims in light of the teachings of U.S. Patent No. 4,695,055 to Newcomb et al. This patent was cited by the Applicants in the Supplemental Information Disclosure Statement (Paper No. 8, filed September 21, 1999) and previously considered by the Examiner (Paper No. 19, mailed October 12, 2001).

In response to the Board's remand, the Examiner has now rejected claim 14 under 35 U.S.C. § 102(b) as being anticipated by Newcomb et al., U.S. Patent No. 4,695,055. In this regard, the Examiner stated the following:

Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Newcomb (4,695,055). Newcomb discloses a golf ball formed from reaction injection molding (column 1, lines 36-40). The ball structure includes a homogenous translucent plastic and a light stick inserted therein to make the golf ball multiple pieces. Note column 1, lines 55-57 which teach a polyurethane material for forming the ball.

However, as indicated above, claim 14 has been amended to overcome this rejection. Claim 14, as amended, is directed to a multi-piece golf ball comprising a core and a cover formed from a reaction injection molded material comprising polyurethane/polyurea. This structure is unlike the two-piece structure of Newcomb comprising a homogenous translucent plastic sphere having a diametrical hole extending therethrough and an inserted light stick.

Additionally, the Examiner rejected claims 1-44 under 35 U.S.C. § 103(a) as being unpatentable over Melvin et al. (U.S. Patent No. 5,779,562) or Cavallaro et al. (U.S. Patent

No. 5,813,923), each in view of Newcomb et al. (U.S. Patent No. 4,695,055). Specifically, the Examiner stated the following:

Claims 1-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melvin et al. (562) or Cavallaro et al. (923), each in view of Newcomb (4,695,055). The latter reference renders it obvious to mold the polyurethane layers of the primary reference golf balls by a reaction injection molding process, since such is an obvious expedient for providing the desired resiliency in a golf ball, as illustrated by the secondary reference. Any other possible distinctions over said thus modified golf balls are deemed conventional molding techniques that would necessarily be used in such molding process.

Regarding instant claims 1-13, the particular details for the recited method have been determined to be obvious lacking a showing of their criticality by a new and unexpected result. See *In re Aller et al.* 105 USPQ 233. The appellant has noted that the references lack the particular flex modulus and reaction time of the instant claims, however, he has failed to provide any test results or arguments in affidavit form which would disprove that these numbers are merely workable ranges obtained by routine experimentation. Thus, it would have been obvious to one of ordinary skill in the art to form the golf ball of Melvin et al. or Cavallaro et al. utilizing the reaction injection molding method detailed by Newcomb and according to the instantly claimed numbers as the appellant has not shown that these particular numbers solve any stated purpose and it appears that the combination of Melvin et al. or Cavallaro et al. each in view of Newcomb would accomplish similar purposes.

Regarding instant claims 14-37, as set forth above, the combination of Melvin et al. or Cavallaro et al. each in view of Newcomb would provide a golf ball comprising a reaction injection molded material comprising polyurethane/polyurea.

Regarding claims 38-41, as set forth above, the combination of Melvin et al. or Cavallaro et al. each in view of Newcomb would provide a golf ball comprising a reaction injection molded material comprising polyurethane/polyurea. Further, the step defining cycling at least 20% of the polyurethane/polyurea has been determined to be obvious lacking a showing of the criticality of the recited amount.

Regarding claims 42-44, as set forth above, the combination of Melvin et al. or Cavallaro et al. each in view of Newcomb would provide a golf ball comprising a reaction

injection molded material comprising polyurethane/polyurea. Also, as the appellant has failed to provide any test results or arguments in affidavit form which would disprove that these numbers are merely workable ranges obtained by routine experimentation, it would have been obvious to one of ordinary skill in the art to form the golf ball of Melvin et al. or Cavallaro et al. utilizing the reaction injection molding method detailed by Newcomb and according to the instantly claimed numbers.

However, it is respectfully submitted that the present invention is not obvious and unpatentable in view of the references cited. Hence, it is respectfully submitted that all of the pending claims are patentable over the noted references for at least the following reasons.

A. SUMMARY OF THE INVENTION

The present invention is directed to a process of making a conventional or U.S.G.A. conforming golf ball of multi-piece construction (claim 1). The balls include a first-chemical-reaction-produced component, such as a core and/or cover layer. The process comprises making at least one cover component and core component of the ball by mixing two or more reactants that react and form a reaction product with a flex modulus of 5-310 kpsi in a reaction time of 5 minutes or less (claim 1). The component has a thickness of at least 0.01 inches and a demold time of 10 minutes or less (claim 1).

The present invention is also directed to a multi-piece golf ball comprising a solid core and a cover formed from a reaction injected molded material comprising polyurethane/polyurea (amended claim 14).

Additionally, the present invention is directed to a process for producing a golf ball including the step (a) of: reaction injection molding a polyurethane/polyurea material to form at least one of a core layer and a cover layer of the ball (claim 38).

Moreover, the present invention is directed to a process for producing a golf ball comprising (a) forming a core, (b) covering the core, (c) coating and adding indicia to the covered ball (claim 40). The process further comprises at least one of the steps (a) and (b) comprising reaction injection molding of a polyurethane/polyurea material (claim 40).

Furthermore, the present invention is directed to a golf ball comprising at least one fast-chemical-reaction-produced layer (claim 42). The fast-chemical-reaction-produced

layer has a flex modulus of 5-310 kpsi in a reaction time of 5 minutes or less and a thickness of at least 0.01 inches (claim 42).

The present invention is also directed to a golf ball having a core and a cover, wherein the cover comprises polyurethane/polyurea, which is formed from the reactants, 5-100 percent weight or which are obtained from recycled polyurethane/polyurea (claim 44).

B. THE EXAMINER'S CITED REFERENCES

U.S. Patent No. 4,695,055 to Newcomb et al. is for an "Illuminated Translucent Golf Ball." The ball serves a dual purpose. It reportedly may be used in the daytime. Alternatively, it may be illuminated by the insertion of an activated chemiluminescent light stick into a hole running through the center of the ball for use in the dark. Col. 1, lines 28-32 of the '055 patent.

More particularly, the ball of the Newcomb et al. '055 patent is a one-piece golf ball. It is devoid of any separate core and inner cover layers. The ball has a permanent hole (about 3/16 inch in diameter) extending diametrically through the ball. This feature distinguishes it from conventional balls. Column 2, lines 13-17 of the '055 patent. The object of the hole is to make possible the acceptance therein of a chemiluminescent light stick. The purpose of the light stick when activated and placed in the hole is to create a sufficient degree of illumination of the ball so that it is clearly visible in the dark, in flight or on the ground. Column 2, lines 20-26.

Additionally, the ball structure of Newcomb et al. is further completely different from conventional balls in that it is made of a homogenous translucent plastic material. The one-piece ball with a hole present through its center is reportedly made by known methods such as, for example, cast molding, injection molding, or reaction injection molding. Furthermore, the term translucent plastic includes a transparent plastic. Column 1, lines 36-41. The transparent plastic material of choice is made of thermoplastic polyurethane. Column 1, lines 55-56 of the '055 patent.

In an alternative embodiment, the illuminated translucent golf ball is also designed to have reduced resilience and restricted flight. As a result, the illuminated ball of this embodiment will travel a much shorter distance than conventional balls. Column 2, lines 6-12 of the '055 patent.

U.S. Patent No. 5,779,562 to Melvin et al. is directed to a solid golf ball comprising a multi-layered core and multi-layered cover. In preparing golf balls in accordance with Melvin et al., a hard inner cover layer is molded (by injection molding or compression molding) about a core, preferably a soft core. (Column 18, lines 59-62.) A comparatively softer outer layer is molded over the inner layer. (Column 18, lines 62-63.)

U.S. Patent No. 5,813,923 to Cavallaro et al. is directed to a multi-layered golf ball comprising a core, cover layer, and mantle layer disposed between the core and cover layer. The solid cores can be either injection or compression molded. (Column 14, lines 37-39.) Also, the undersized wound cores are produced through conventional means. (Column 14, lines 39-40.) The mantle layer is subsequently injection or compression molded about the core. (Column 14, lines 41-42.) The cover layer or layers are then injection or compression molded or cast about the mantle layer. (Column 14, lines 44-46.)

**C. THE SUBJECT MATTER OF CLAIMS 1-44 ARE
PATENTABLY DISTINGUISHABLE OVER THE CITED ART**

The present invention concerns improved, U.S.G.A. conforming or conventional golf balls comprising separate cores and covers, at least one of which is produced by a fast chemical reaction. This invention is not disclosed by the novelty item of Newcomb et al., even in combination with the golf balls of Melvin et al. and/or Cavallaro et al.

Specifically, the present invention is directed to two (or more) piece golf balls, i.e., golf balls comprising at least a core and a cover. The balls and/or components thereof are produced by reaction injection molding, i.e., RIM, utilizing a fast chemical reaction. Unlike other golf ball components made of ionomer, balata and slow reacting polyurethane and by known methods such as cast molding, injection molding, etc., the present components are formed by a fast chemical reaction. In this process, the core and/or cover component is produced by mixing two or more materials that react to form a reactive product with a flex modulus of 5-310 kpsi in a reaction time of about 5 minutes or less, the component having a thickness of at least 0.01 inches and a demold time of 10 minutes or less including the reaction time.

The '055 Newcomb et al. patent discloses a novelty type of an illuminated translucent golf ball. The "glow-in-the-dark" ball is designed for nighttime play. While the ball can also be utilized for daytime play, it is not a conventional golf ball. This is because

the Newcomb et al. ball consists of a one-piece molded sphere with a large hole running through the center of the ball. Contrary to the self-serving statements made by Newcomb et al., such a large hole running through the center of a ball is clearly noticeable (see, for example, Figures 1, 4, etc.) and does have an effect on the performance characteristics of a ball.

More particularly, as a result of the large hole running through the center of the ball, the ball is asymmetrical. It will not travel or spin the same as a conventional ball. It is also illegal and in violation of the U.S.G.A. rules requiring symmetry. See Rule 3 concerning "spherical symmetry" in the attached appendix.

Furthermore, when the light stick is inserted, the ball will weigh more than the weight restrictions imposed by the U.S.G.A. This is because the light stick adds mass to the ball. Moreover, due to differences in density, volume, etc., the addition of the light stick also fails to overcome the symmetry requirements specified by the U.S.G.A. Consequently, the ball of the Newcomb et al. '055 patent is a novelty item and clearly not a conventional or U.S.G.A. conforming golf ball.

Additionally, the '055 patent briefly suggests that the unique structure of the ball disclosed therein (i.e., "The ball structure is completely different from all golf balls now commonly in use ...") can be made by known molding methods. Examples of such methods include cast molding, injection molding or reaction injection molding. Column 1, lines 36-40 of the '055 patent. However, outside of this brief "shotgun disclosure" of reportedly known molding processes, no further information is provided in the '055 patent as to how such a novelty golf ball, let alone a commercial or conforming ball, can be produced by reaction injection molding.

In this regard, the examples of the '055 patent related to the injection molding of the unique structure of the ball. The material disclosed is a thermoplastic polyurethane. No information is provided directed to how such a ball could be molded utilizing reaction injection molding, the types of reactants, catalysts, or reactive components to be utilized, the cream, gel or reaction times, the types of molds, injectors, aftermixers, and mixing heads, the molding pressures and temperatures, components thickeners, demold times, etc. Accordingly, besides the sole reference to reaction injection molding in the brief shotgun disclosure of possible molding processes set forth in column 2, lines 39-40 of the

Newcomb et al. '055 patent, the reference fails to disclose and/or teach how a golf ball is produced by reaction injection molding.

Along this line, Applicants are believed to be the first to produce a conventional and/or U.S.G.A. conforming multi-layer golf ball by a fast-chemical reaction. While reaction injection molding technology was somewhat known at the time Cavallaro and Melvin were filed, neither of these references teaches the use of reaction injection molding in golf balls. Therefore, if any motivation existed for using reaction injection molding technology in novelty items for golf balls, it would likely be disclosed in the Melvin and Cavallaro patents. But, such disclosure does not exist. As such, no motivation exists to combine the Examiner's cited references and the Examiner's attempt to combine such references is impermissible hindsight reconstruction.

Furthermore, even if Melvin or Cavallaro could be combined with Newcomb, the combination of these references would not render the present claims 1-44 obvious. In this regard, independent claim 1 recites a process for producing a conventional multi-piece golf ball by making at least one cover component and core component of the ball by mixing two or more reactants that react and form a reaction product. The reaction product has a flex modulus of 5-310 kpsi in a reaction time of 5 minutes or less. The component has a thickness of at least 0.01 inches and a demold time of 10 minutes or less. The combination of Melvin or Cavallaro with Newcomb et al. does not teach or even suggest a single feature recited in claim 1 let alone the combination of features recited in claim 1. *Particularly, the Examiner's references neither teach nor suggest the reaction product having a flex modulus of 5-310 kpsi in a reaction time of 5 minutes or less; and a component formed from the reaction product having a thickness of at least 0.01 inches and demold time of 10 minutes or less.* The mere mention of the possible use of polyurethane in a golf ball by Melvin and Cavallaro and/or the brief reference to reactive injection molding in Newcomb et al. in no way would provide sufficient motivation to lead a formulator to employ a reaction product having a flex modulus of 5-310 kpsi in a reaction time of 5 minutes or less, and to utilize a component formed from that reaction product having a thickness of at least 0.01 inches and a demold time of 10 minutes or less.

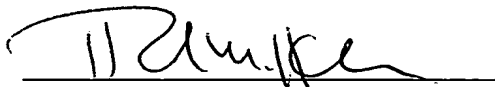
CONCLUSION

In view of the above, Appellant respectfully submit that claims 1-44 as amended are non-obvious and patentable over the combination of Newcomb with Melvin or Cavallaro.

Respectfully submitted,

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Lynda S. Kalemba

**VERSION OF CLAIMS
WITH MARKINGS TO SHOW CHANGES MADE
December 3, 2002**

1. (Amended) A process of making a conventional multi-piece golf ball comprising making at least one of a cover component and a core component of the ball by mixing two or more reactants that react and form a reaction product with a flex modulus of 5 - 310 kpsi in a reaction time of about 5 minutes or less, the component having a thickness of at least 0.01 inches and a demold time of 10 minutes or less.

14. (Amended) A multi-piece golf ball comprising a core and a cover formed from a reaction injection molded material comprising polyurethane/polyurea.

APPENDIX III The Ball

APPENDIX A

1. Weight

The weight of the ball shall not be greater than 1.620 ounces avoirdupois (45.93 gm).

2. Size

The diameter of the ball shall not be less than 1.680 inches (42.67 mm). This specification will be satisfied if, under its own weight, a ball falls through a 1.680 inches diameter ring gauge in fewer than 25 out of 100 randomly selected positions, the test being carried out at a temperature of $23 \pm 1^{\circ}\text{C}$.

3. Spherical Symmetry

The ball must not be designed, manufactured or intentionally modified to have properties which differ from those of a spherically symmetrical ball.

4. Initial Velocity

The initial velocity of the ball shall not exceed the limit specified (test on file) when measured on apparatus approved by the United States Golf Association.

5. Overall Distance Standard

The combined carry and roll of the ball, when tested on apparatus approved by the United States Golf Association, shall not exceed the distance specified under the conditions set forth in the Overall Distance Standard for golf balls on file with the United States Golf Association.